WLPCS
Geometry

TOPIC 1: Midpoint and Distance

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$midpoint = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

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TOPIC 2: Midsegment Theorem

To create a midsegment:

1. Find and mark the midpoint of one side of the triangle.
2. Find and mark the midpoint of a second side of the triangle.
3. Connect the two midpoints with a line segment (the midsegment).
4. The midsegment is both parallel to and half the length of the third side.
5. The two triangles created are similar. You can prove they are similar by SSS, SAS, or AA.
    a. SSS: Each set of corresponding sides are in a ratio of 1:2.
    b. SAS: Each set of corresponding sides are in a ratio of 1:2 and the two triangles share an angle.
    c. AA: The triangles share an angle and the parallel sides and transversals create pairs of corresponding angles, which are congruent.

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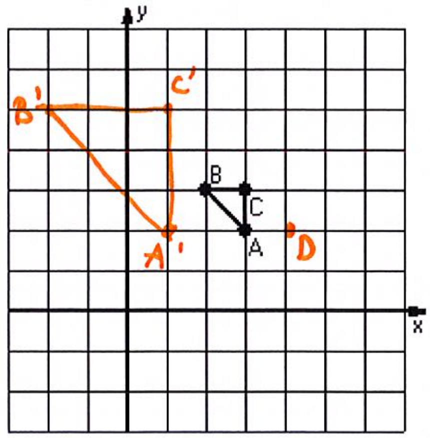
TOPIC 3: Dilations

Dilation scale = 3, center D(4,2)



Remember that dilations:

- create similar figures
- have corresponding sides that are parallel
- have corresponding sides that are proportional (in equal ratios)

Also remember that:

- corresponding points and the center of dilation are collinear

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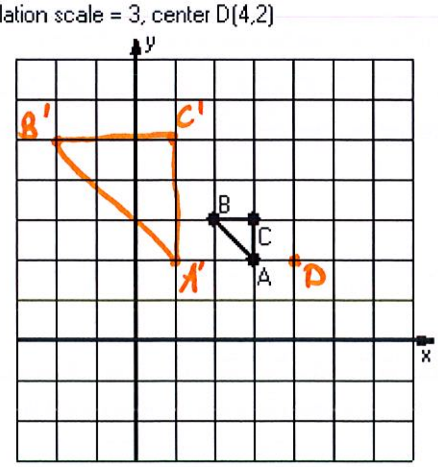

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TOPIC 4: Introduction to Trigonometry

The three trigonometric ratios are below:

SOH $\sin\theta = \dfrac{\text{opposite}}{\text{hypotenuse}}$

CAH $\cos\theta = \dfrac{\text{adjacent}}{\text{hypotenuse}}$

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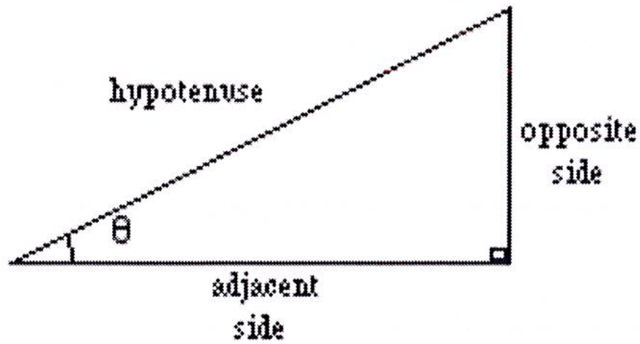

The sine, cosine or tangent of θ is the same for all right triangles. Any right triangle with angle θ is similar to any another right triangle with angle θ. Because they are similar, their sides are proportional; therefore, the ratio of their opposite side to hypotenuse, adjacent side to hypotenuse, and opposite side to adjacent side will be equal.

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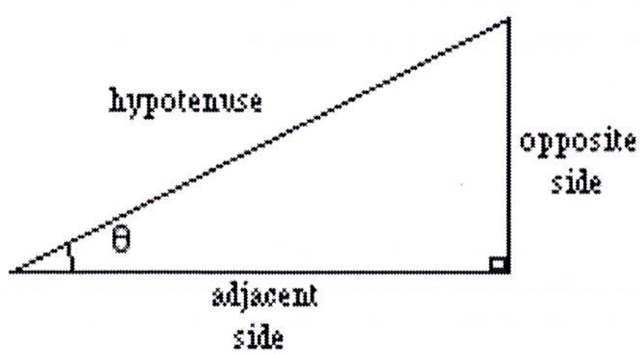

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